Service Manual

for

C25 / C2588

V 1.0

1 Introduction

The C25 is the first dualband handset (GSM-900 and GSM-1800) in the C-class. The C2588 is a special version for the asian market featuring a graphic display instead of the alphanumeric C25 display.

This manual is intended to help you carry out repairs up to level 2 on the mobile telephones C25 and C2588.

For information on level 2.5 repairs or on the testequipment, please refer to the available documentation.

The repairs for C25 and C2588 are identical unless otherwise noted, and therefor in the text only C25 is mentioned.

Attention:
It must be noted that all repairs have to be carried out in an environment set up according to the ESD (Electrostatic Discharge Sensitive Devices) regulations defined in international standards.

If you have any questions or comments regarding repair procedures or this service manual, please do not hesitate to contact the technical support team in Kamp-Lintfort, Germany:

☎: +49 2842 95 4666
: +49 2842 95 4302
: ralf.fleuren@klf.siemens.de

2 Table of Contents

1 INTRODUCTION 2

2 TABLE OF CONTENTS 3

2 TECHNICAL DATA 5

3 GENERAL INFORMATION 6

4 MECHANICAL CONCEPT 6

4.1 MECHANICAL DRAWING 8
4.2 NECESSARY TOOLS 9
4.3 DISASSEMBLING THE C25 9
4.4 ASSEMBLING THE C25 12
4.5 HANDSET DATECODES 15

5 HARDWARE CONCEPT 16

5.1 BLOCK DIAGRAM 16
5.2 HARDWARE DESCRIPTION 17
5.3 POWER SUPPLY CONCEPT 19
5.4 OVERVOLTAGE CONDITIONS 20

6 SOFTWARE PROGRAMMING 21

6.1 HARDWARE OVERVIEW 21
6.2 DESCRIPTION OF SOFTWARE BOOTING 21
6.2 LANGUAGE GROUPS 22

7 BATTERY 23

7.1 SPECIFICATION 23
7.2 CHARGING 24
7.3 SHORT CIRCUIT PROTECTION 24
7.4 DEEP DISCHARGE 25
7.5 BATTERY DATECODES 26

8 UNBLOCKING 27

8.1 SIEMENS HOTLINE 27
8.2 INTERNET SOLUTION 28

9 ACCESSORIES 29

9.1 STANDARD CHARGER (INCLUDED IN PACKAGE) 29
9.2 BATTERY (INCLUDED IN PACKAGE) 29
9.3 SPARE BATTERY 30
9.4 RAPID CHARGER 30
9.5 TRAVEL CHARGER 30
9.6 DESK TOP CHARGER 30
9.7 DESIGNER CASES 30
9.8 BELT CLIP 31
9.9 HEADSET 31
9.10 CAR CRADLE 31
9.11 ANTENNA CRADLE 31
9.12 CAR CHARGER 32
9.13 CAR KIT PORTABLE 32
9.14 CAR KIT COMFORT 32

9.15 CAR HANDSET 32

2 Technical Data

Length:	116 mm (w/o antenna) 137 mm (with antenna)
Width:	46 mm
Thickness:	28 mm (max.)
Volume:	118 cm³
Weight:	130 g (approx.)
Standards:	GSM Phase 2
Performance:	GSM 900, Class 4 (2 Watt) GSM 1800, Class 1 (1 Watt)
Battery:	NiMH, 3.6V, 700 mAh
Standby time:	Up to 100 hours
Talk time:	Up to 5 hours
Charging time:	up to 6 hours (with Standard Charger) up to 1.5 hours (with Rapid Charger, optional)
Display:	**C25:** 3 lines of 12 characters each + 1 dedicated icon-line **C2588:** Graphical display 97*33 pixels
SIM Card Type:	Plug-In, 3V (**Attention:** 5V-SIM **not** supported)
Antenna:	Non-retractable, Lambda/2 helix type, Plug-In
Accessories:	**a) Standard:** Standard Charger, Battery (3.6V, 700mAh) **b) Optional:** Spare Battery, Rapid Charger, Travel Charger, Desk Top Charger, Designer Cases, Belt Clip, Headset, Car Cradle, Antenna cradle, Car Charger; Car Kit Portable, Car Kit Comfort, Car Handset

3 General Information

With the C25/C2588 is the second model of the C-class of Siemens Mobiles. The intention of this class is to offer low cost entry-level mobile phones for the mass consumer market. It is of a small size and has an attractive design.

This telephone is a so called **Dual band telephone**, meaning it is capable of operating in GSM 900 networks as well as in GSM 1800 ones.

The C2588 is a special version of C25, which is designed for the asian market. Besides a separate software version for C2588 the main difference between the two models is the type of display used:

The C25 features an alphanumeric display comparable to C10.

The C2588 is equipped with a graphical display of 97*33 pixels, which enables the telephone to display chinese characters to the user.

4 Mechanical Concept

Note: All part numbers refer to mechanical drawing in section 4.1!

The mechanical concept of the C25 differs in various points from the one of the other Siemens mobile telephones.

The first thing you will experience is how the housing is locked. In C25 no screws are used to keep the housing closed. Also inside the telephone no screws are used anymore. To open the housing, which is kept closed by catches only, a special opening tool has been defined. For details on disassembly please refer to the relevant chapter in this manual.

Inside, the C25 consists of just one board (1010) which carries display module (1170), control part and RF section of the mobile.

The display module (1170) is connected to the board by a flexible cable which is inserted into a plug. In case the display is defective electrically or mechanically it can be exchanged very easily.

In opposite to the MMI board of other phones (e.g. S6 and E10) the ringer (1100) is not soldered to the board, but is mechanically fixed on one of the shielding covers (1310) by a metal clip (1190) and electrically connected to the board by a cable and a plug. The ringer in C25 is of the same type as the one used in C1x mobiles.

C25 does have an external connector of a new type. Since S6 a so called „Molex"-connector was used, which also offered the possibility to connect an external antenna to it. The new „Lumberg"-connector which is used in C25 does not feature such a connection, because the connector for external antenna is located at the back side of the upper end of the mobile, close to the internal antenna (1130). As a consequence of this there is no need anymore for a RF cable mounted to the board nor for a RF plug on it to connect this cable. This improves RF-properties of the mobile and lowers production costs.

To be able to do measurements on and software update of the telephone, an adapter cable between Molex- and Lumberg connector will be available. For details please refer to the chapter *Software Programming* of this manual.

As already for C1x mobiles, also C25 antenna (1130) is of a plug-in type inserted into the lower case shell (1030), which also carries the microphone (1110). Make sure that the microphone contact springs are not dirty or damaged during repair process.

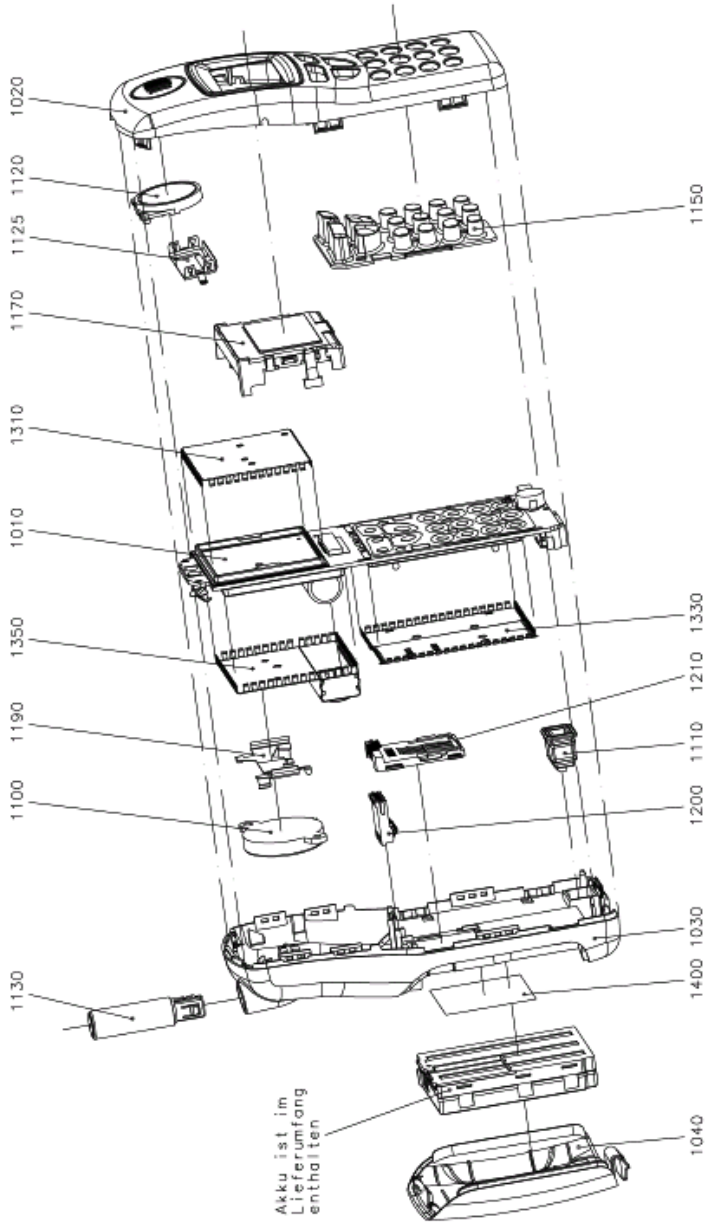
Attention:
Because the C25 is a dual-band mobile operating on GSM900 **and** GSM1800, the antenna is different from the one used in C10 and C11. Please refer to the spare part list for ordering the right type of antenna!

The keypad (1150) and the loudspeaker (1120) with it's retaining clip (1125) are mounted into the upper case shell (1020).

The dust protection frame and the display window are included in the display module (1170).

Attention:
The displays (1170) of C25 and C2588 are different as well as their RF-and control modules (1010) and the mobile software. Please refer to the spare part list for ordering the appropriate components!

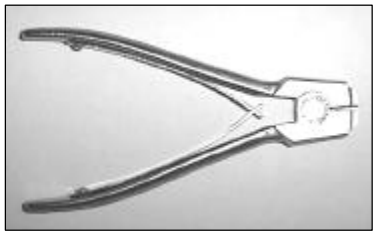
4.1 Mechanical drawing



Note:
The numbers shown above are NO ordering numbers.
For ordering please use the partnumbers supplied by your service manager!

4.2 Necessary tools

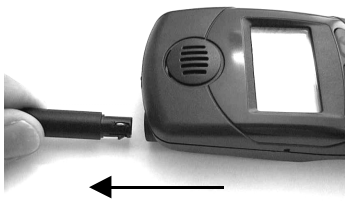
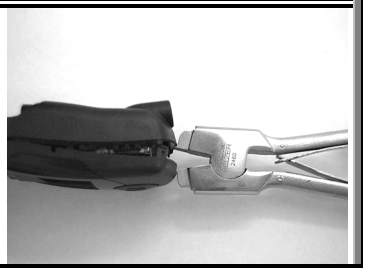
For disassembling the C25 the following Case Opener is mandatory:

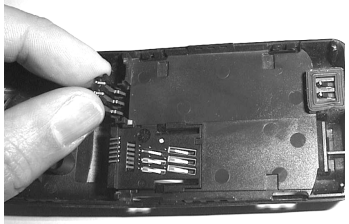
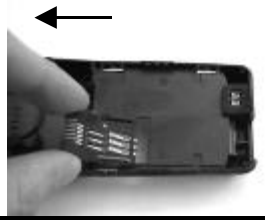
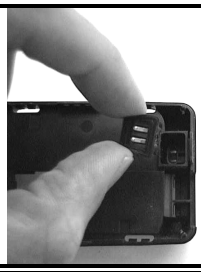
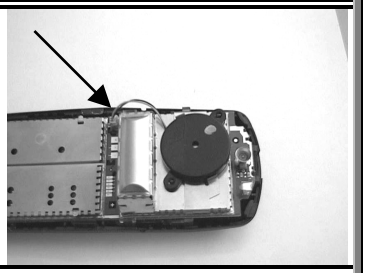
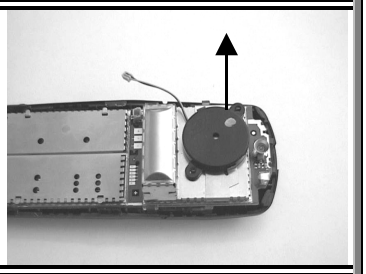
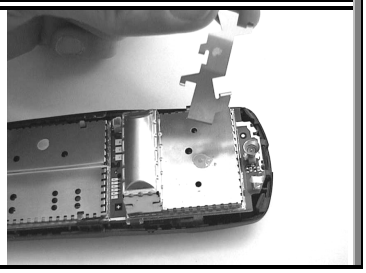


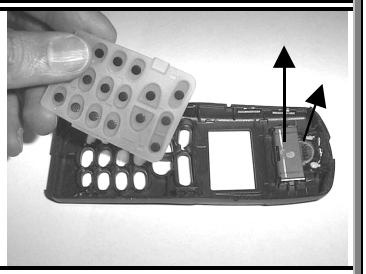
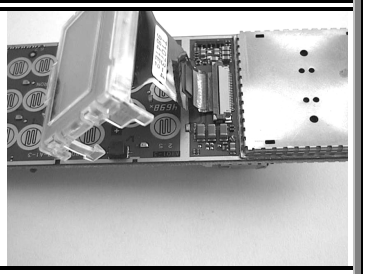
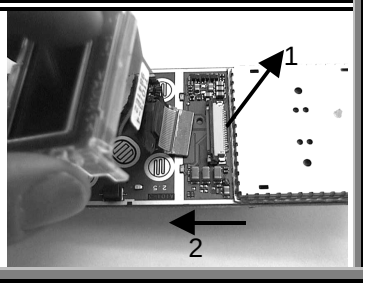
Ordering number of Case Opener:	**F30032-P46-A1**

4.3 Disassembling the C25

<u>Attention:</u> ESD regulations have to be followed!

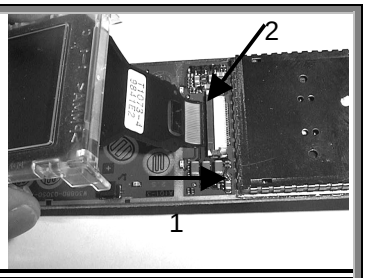
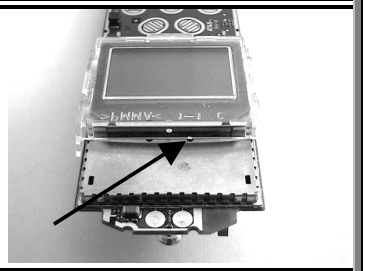
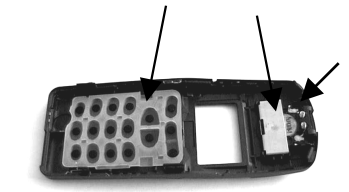
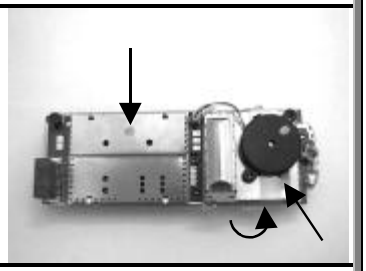
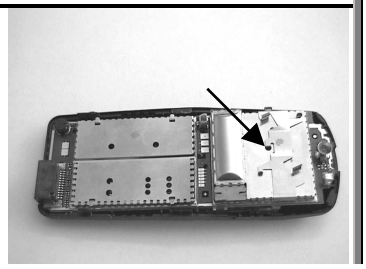
1. You first remove the battery lid and then the battery below.	
2. Now you remove the SIM card.	
3. Then you pull the antenna out.	
4. Open the housing with the opening tool and carefully pull the lower housing section off.	

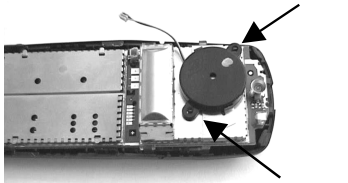
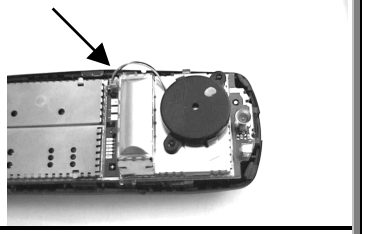
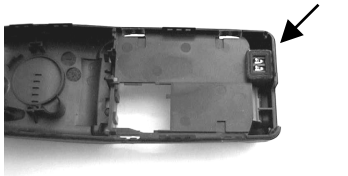
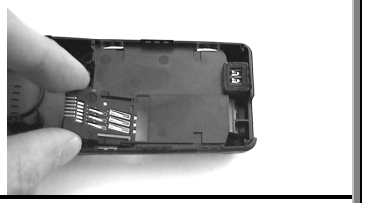
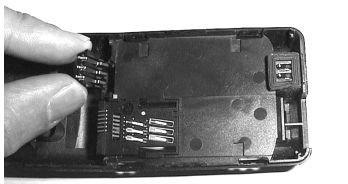
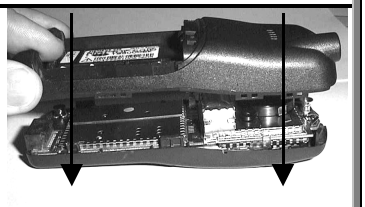
5. Now you remove the battery contacts from the lower housing section.	
6. Remove the card reader from the lower housing section.	
7. Remove the microphone from the lower housing section.	
8. After that you disconnect the ringer plug-in connector.	
9. You then remove the ringer from the lower HF-screen lid.	
10. Remove the clip from the lower HF-screen lid.	

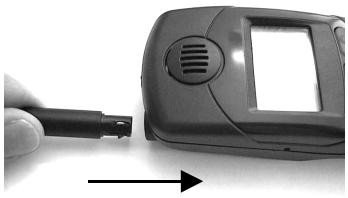
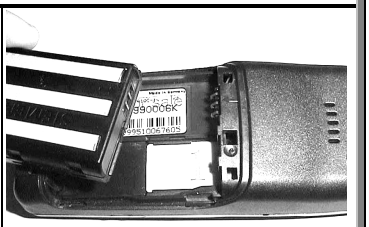
11. Remove the radio and control module from the upper housing section.	
12. After that you remove the keypad mat, retaining clip and the loudspeaker from the upper housing section. **Attention:** The loudspeaker is glued to the upper housing section by a foam covered with glue on both sides. When you remove it, the foam may be damaged.	
13. Carefully release the display from the radio and control module and fold it downwards.	
14. Finally, you carefully release the retaining clip (1) of the plug-in connector and pull the connector cable of the display out (2).	

4.4 Assembling the C25

<u>Attention:</u> ESD regulations have to be followed!

1. First you plug in the connector cable of the display in the retaining clip of the plug-in connector on the module (1) and then close the retaining clip (2).	
2. Now fasten the display to the radio and control module. **Attention!** In order to position the display exactly, the synthetic projection on the lower side of the display frame must be fitted into the hole in the screen lid. The catches must fully engage.	
3. Place the keypad mat, the loudspeaker and its retaining clip in the upper housing section. **Note:** Please first remove the protective foil from the loudspeaker.	
4. Then check whether the HF-screens have been properly secured. Subsequently you place the radio and control module in the upper housing section. **Note:** On the MMI's display side there is a further RF-screen.	
5. Place the clip on the lower HF-screen lid. **Attention!** The metal projection on the clip must engage with the recess in the screen lid.	

6. Position the ringer on the clip. **Attention!** The catches on the clip must engage exactly with the holes in the ringer.	
7. Now you connect the ringer plug-in connector .	
8. Fasten the microphone in the lower housing section. **Attention!** The microphone contacts must not be dirty, damaged or bent.	
9. Fasten the card reader in the lower housing section. **Attention!** The card reader must not be dirty, damaged or bent.	
10. Fasten the battery contacts in the lower housing section. **Attention!** The battery contacts must not be dirty, damaged or bent.	
11. Now close the device by putting on the lower housing section. **Attention!** All catches must engage completely.	

12. Push the antenna in.	
13. Now insert the SIM card.	
14. Finally you insert the battery and close the battery compartment with the battery lid.	
15. Now you have assembled the phone completely.	

4.5 Handset Datecodes

Siemens is using the industrial standard DIN EN 60062 to indicate the production / service dates. The code is printed on the IMEI sticker located in the battery compartment.

YY = Datecode

- The first character of the datecode indicates the year of production:

F = 1995
H = 1996
J = 1997
K = 1998
L = 1999

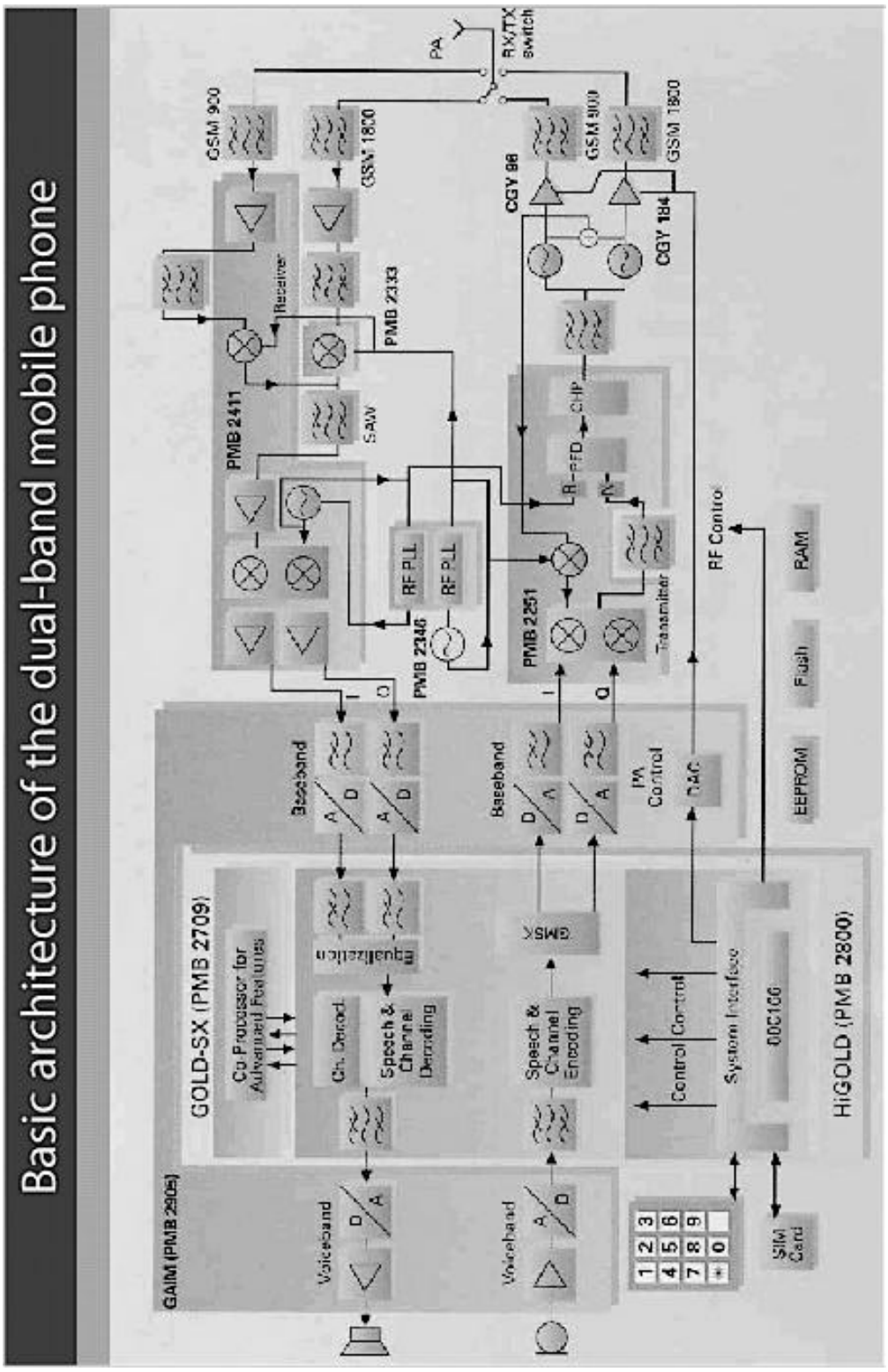
- The second character indicates the month of production:

1-9 = january to september
O = october
N = november
D = december

Example: “L1” means that the set was produced in january of 1999.

5 Hardware Concept

5.1 Block Diagram



5.2 Hardware Description

The handset consists of the following major integrated circuits:

1) HiGOLD (PMB 2800)

This IC is a combination of microprocessor and signalprocessor.

The microprocessor part of this component is responsible for controlling the keyboard, SIM-Card, Flash and RAM. Furthermore it controls the power up/power down of the RF module and sets the amplification of the PA.

The signal processor part of PMB 2800 is responsible for processing the Rx I/Q signals (filtering, equalizing, speech and channel decoding).
Furthermore it does the speech and channel encoding and the GSMK modulation of the Tx I/Q signals.

2) GOLD-SX (PMB 2709)

The coprocessor PMB 2709 is used to realize advanced features regarding coding of the speech signal. These are:

- Halfrate-Encoding
- Halfrate-Decoding
- Enhanced Fullrate Encoding
- Enhanced Fullrate Decoding
- Voice Activity Detection
- Comfort Noise

3) GAIM (PMB 2905)

The GAIM (GAIM = **G**SM **A**nalog **I**nterfacing **M**odule) provides the interface between the analogue signals (I/Q, voiceband, PA-control, charging control signals) and its digital representation.

4) Receiver Circuit (PMB 2411)

This circuit provides the following main functionalities:

- Low Noise Amplifier (LNA) with a fixed amplification of +20dB to amplify the input RF signal.
- Mixer to mix down the RF signal to the Intermediate Frequency (IF)
- Programmable IF amplifier with a dynamic range of 60dB (-10dB ... +50dB in steps of 2dB).

- Mixer to mix down the IF signal to the baseband, generating and inphase (I) and a quadrature (Q) signal.
- Offset compensation for the I/Q signals.

5) Transmitter Circuit PMB 2255

This circuit provides the IF synthesizer, the I/Q modulator, prescalers to regulate the RF synthesizer and a buffer stage to feed the PA.

The antenna switch is mechanical, located in the connector for the external antenna.

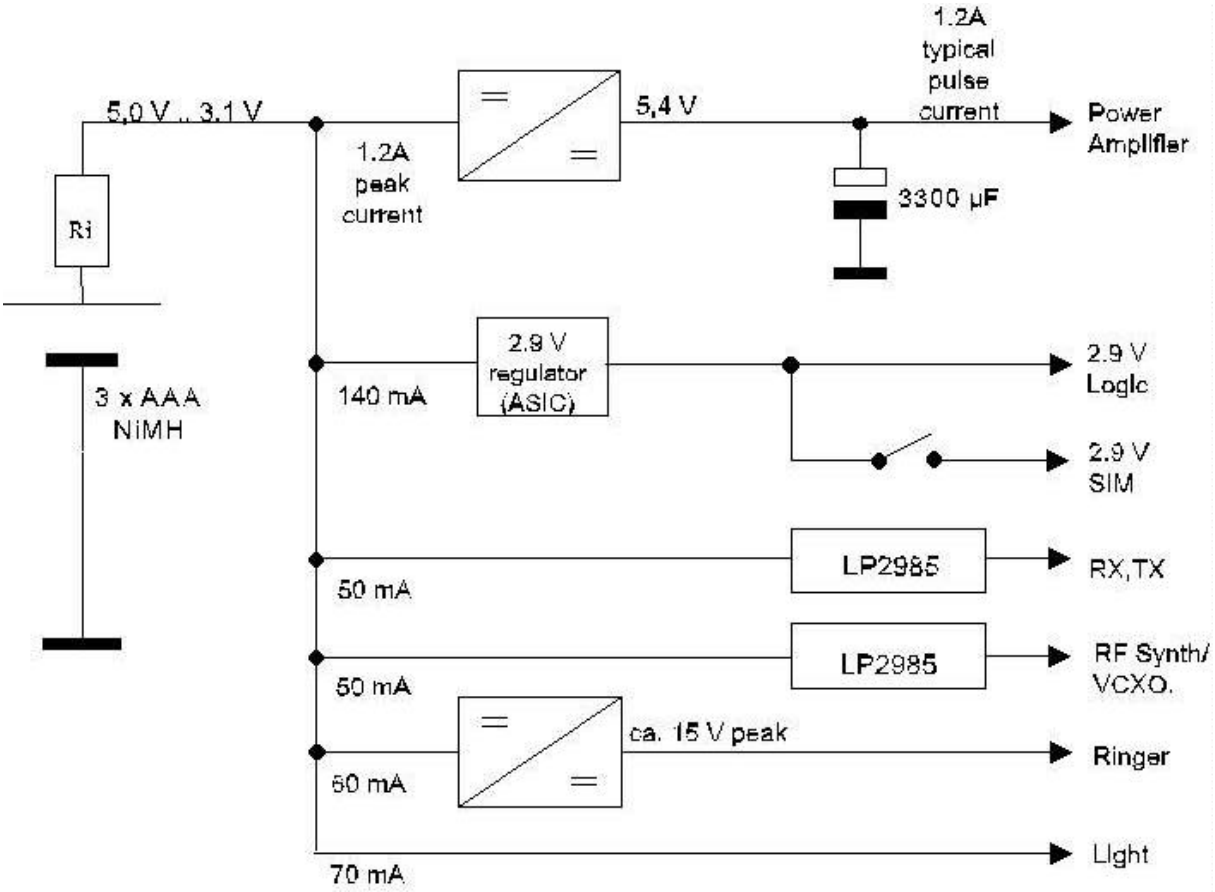
5.3 Power Supply Concept

The C25 has two main power inputs:

1) Battery Voltage (3.6 Volts) connected at the battery contacts

2) Charging Voltage (6.5 Volts) delivered by the different charger types (see accessory list) via the Lumberg connector at the bottom of the telephone.

Since the battery voltage is supplying the power supply asic, it is always needed to operate the phone. You cannot switch on the handset if the battery voltage is not present.



From the battery voltage all other supply voltages of the C25 are derived, controlled by the power supply ASIC.

The RF power amplifier needs an operation voltage of 5,4Volts, which is generated by a DC-DC step-up converter.
The logic module uses 2.9 V, generated by a regulator inside the ASIC.

Furthermore the ASIC generates the supply voltage for the SIM card and the RESET signal for the logic devices.

Attention:
The telephone supplies the SIM card with 3Volts, meaning **5V-SIMs are not supported**. In case a user inserts such a 5Volt card, the telephone will not recognise it and prompt to insert a SIM card the same way as it would in case there is no SIM inserted.
Telephone is not defective. The way to solve this is to get the SIM exchanged by the operator or service provider to a 3V type.

The ASIC also checks the presence of the watchdog signal from the µP and provides the switching on functionality (ON_OFF button or Ignition signal).

During testing ist is advisable to use a battery dummy, connected to a power supply delivering +4V, max 3A.
Make sure that you connect the battery dummy with the right polarity, the red plug to +4V and the blue plug to ground.

If you use a voltage higher than +7V, or with wrong polarity, the phone can be damaged!

5.4 Overvoltage Conditions

a) Battery Voltage: If the supply voltage rises above 6.2 Volts, the phone will switch off and it cannot be switched on again before the voltage is lower than 6.2 Volts.

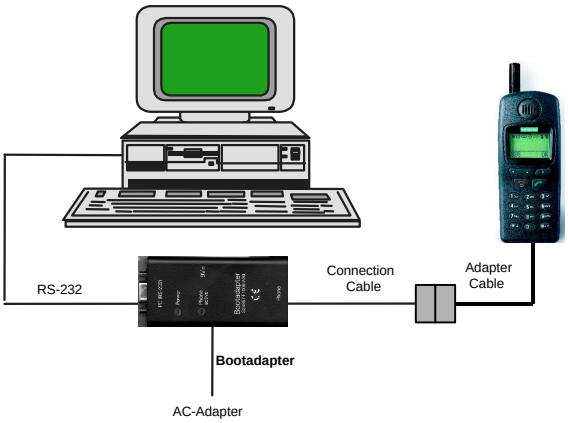
If the supply voltage rises above 7 Volts the phone can be destroyed.

b) Charging Current: The charging current must not rise above 1 A or the phone (fuse) will be inoperable, meaning that charging the battery will not be possible anymore.

- ➢ Be careful with foreign accessories or chargers!
- ➢ Make sure that the charging current is limited to a value below 1A!

6 Software programming

6.1 Hardware overview



The software of the C25 handset is programmed directly from a PC using a bootadapter as an interface between serial port of the PC and the mobile. Because of the new type of external connector used in C25 (Lumberg type) an additional adapter cable between mobile and bootadapter is required.

6.2 Description of software booting

- ☞ Connect COM-port of PC to the bootadapter using the enclosed RS232-cable.
- ☞ Connect adapter cable to the connection cable of the bootadapter.
- ☞ Afterwards plug in AC-Adapter: If connected correctly the “Power” lamp on the bootadapter will be active.
- ☞ Switch off the handset and connect it to the adapter cable.
- ☞ Copy bootsoftware to the PC and follow the instructions in the file “readme.txt”.

Ordering number of Adapter cable:	**V30146-A5004-D**
Ordering number of Bootadapter:	**L24857-F1006-A30** The bootadapter comes complete with AC-Adapter, RS-232 and handset connection cable.

6.2 Language Groups

For C25/C2588 the following languages will be available. They will be separated into different language groups.

Bahasan Indonesia	Bahasan Malaysia	Catalan
Cestina	Danish	Dutch
English	Finnish	French
German	Greek	Hungar
Italian	Norsk	Polish
Portu	Russian	Spanish
Swedish	Turkish	

Attention:
This information is subject to change! Contact your service coordinator for the latest update and ordering numbers.

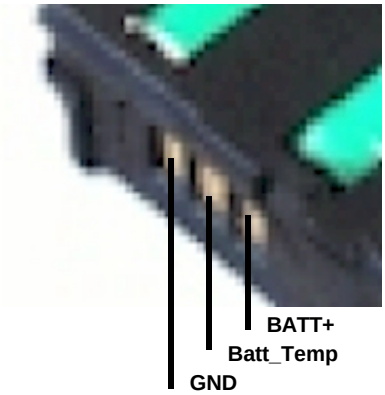
7 Battery

7.1 Specification

The C25 battery is a NiMH type with a voltage of 3.6Volts and a capacity of 700 mAh.

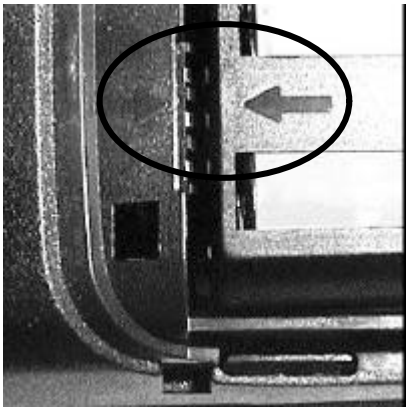
Suppliers are Varta and Maxell. You can easily recognize the manufacturer by the colour of the battery cells: Varta's cells are of a green colour, Maxell's ones are bluish.

The connections BATT+ and GND are used to supply the phone with power. The connector BATT_TEMP can be used by the mobile to measure the temperature of the battery cells.



Insertion of battery:

To insert the battery the right way round, on the housing inside the battery compartment of C25 and on the battery there are two arrows, which have to mach each other. If the battery would be inserted any other way round, the battery cover probably can be closed, but the phone of course will not be operational.



7.2 Charging

The battery can only be charged if inserted into the telephone. The charging process is completely controlled by the mobile. Different kinds of Siemens chargers out of the accessory program for C25 models can be used for this task:

- Standard charger
- Quick charger
- Desk top charger
  (This device is not really a charger but a stand for the mobile, where Standard- , Quick- or Travel charger are connected to)
- Travel charger
- Car charger

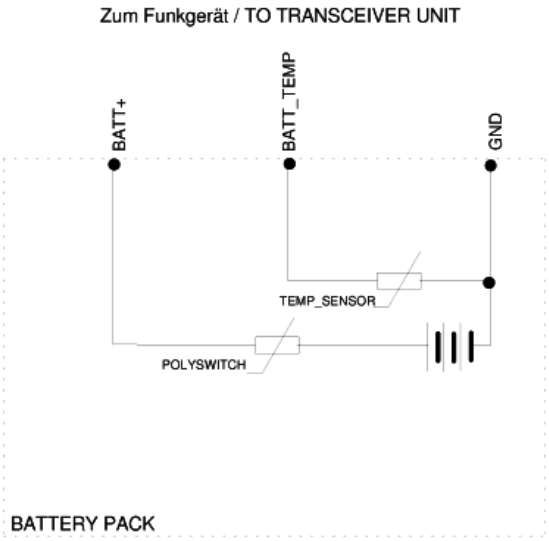
Attention:
Charging the battery can be impossible, if the temperature is too high (e.g. in car use during summer) or too low. This is to prevent the battery from being damaged during fast charge process. To enable the charging process again, battery and phone only needs to cool down/warm up. A replacement of battery is not necessary.

7.3 Short Circuit Protection

CAUTION: **Avoid short circuit of battery !**

The battery is not short-circuit protected by an electronic fuse like e.g. in S10. Inside the battery a polyswitch is protecting the battery cells from a too high output current.

Schematic of the battery:



7.4 Deep Discharge

In case of a deeply discharged battery, the phone can not be turned on and the normal charging process can not be started.

In this case, charging the battery is divided into two different steps, which have to be run subsequently:

a) Trickle charge

Trickle charge mode is automatically started if the battery voltage is below a certain value when the charger is connected to the mobile. This mode is not terminated automatically but has to be terminated by disconnecting the charger.

Trickle charge mode has to last minimum until the battery voltage has exceeded a certain level. During trickle charge the charging symbol will not be visible and the telephone can not be turned on. This is because the battery voltage is too low to operate the telephone

Action:
Insert battery into handset and connect travel charger to the telephone. Wait for appr. 1 hour, then disconnect and reconnect charger. If the battery voltage is high enough again, the charging symbol will come up.

If the battery is discharched very deeply, the symbol may not come up and the trickle charge time possibly has to be extended up to 24 hours.

b) Normal charge

When the battery voltage is above the a.m. value (e.g. by trickle charge) the mobile will start the normal charging mode and show a charging symbol in the display.

Action:

Connect charger to the telephone.

The charging symbol will come up as an indication that the normal charging process has been started by the mobile.

7.5 Battery Datecodes

There are two different suppliers of the C25 batteries and they use different kinds of codes to give information about production date:

a) Maxell batteries

The datecode printed on the battery looks like this:

K 7 08 20 M

Explanation:

K = Year of production (1998=K, 1999=L)
7 = Month of production (Jan=1, Feb=2, ...Oct=O, Nov=N, Dec=D)
08 = Day of production (1^{st} =1, 2^{nd} =2, 3^{rd} =3,....., 31^{st}=31)
20 = Week of cell-production
M = Factory code (M=UK, E= Germany)

Example:

K 7 08 20 M This battery was produced on July 8^{th} of 1998!

b) Varta batteries

The datecode printed on the battery looks like this:

TOS 8 G9 VA 1

Explanation:

TOS = Battery cells supplied by Toshiba
8 = Revision level
G = Year of production (1997=J, 1998=K, 1999=L)
9 = Month of production (Jan=1, Feb=2, ...Oct=O, Nov=N, Dec=D)
VA = Varta (battery manufacturer)
1 = Place of manufacturing (1=Germany ,2= Novibor, Czech Republic)

Example: TOS 8 K4 VA 1 This battery was produced in april of 1998!

8 Unblocking

If the phone is disabled due to a wrong entry of the phonecode (not PIN1, PIN2, network code or service provider code!) it can only be resetted by entering the right unblocking code.

This unblocking code is derived from the IMEI number of the mobile and can only be calculated in two different ways:

8.1 Siemens Hotline

You can retreive the code from our hotline personell in Germany.
If you need unblocking codes just send a fax with the IMEI numbers to:

Siemens AG
PN MP SH
World Service Center
Bocholt, Germany

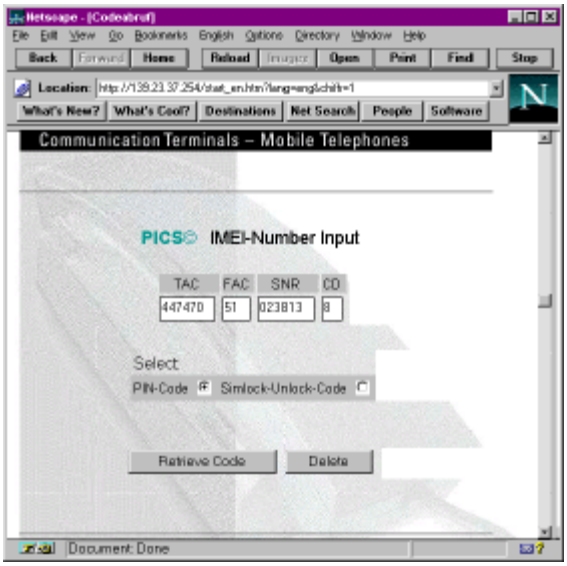
Fax: +49 2871 91 3007

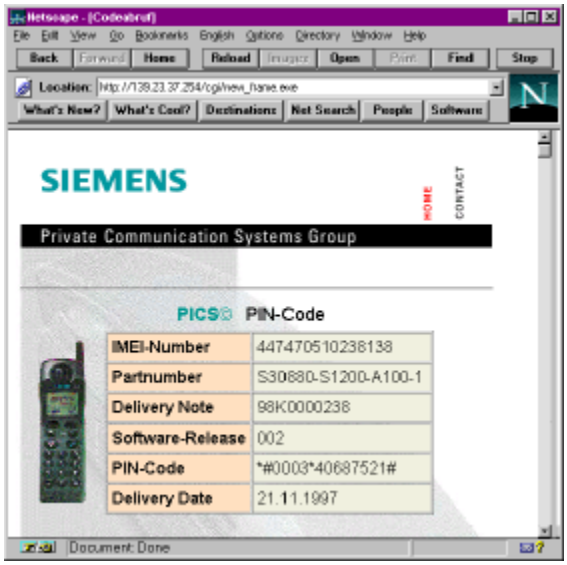
Please use the appropriate form provided by your Siemens service coordinator.

8.2 Internet solution

As an alternative to the a.m. procedure, since november 1997 an internet solution is offered to the LSO. It is a password protected internet homepage where you can enter the IMEI number of the affected handset. The page will then present Master Phone Codes, Master Network Codes and Master Service Provider Codes (if applicable to the relevant telephone).

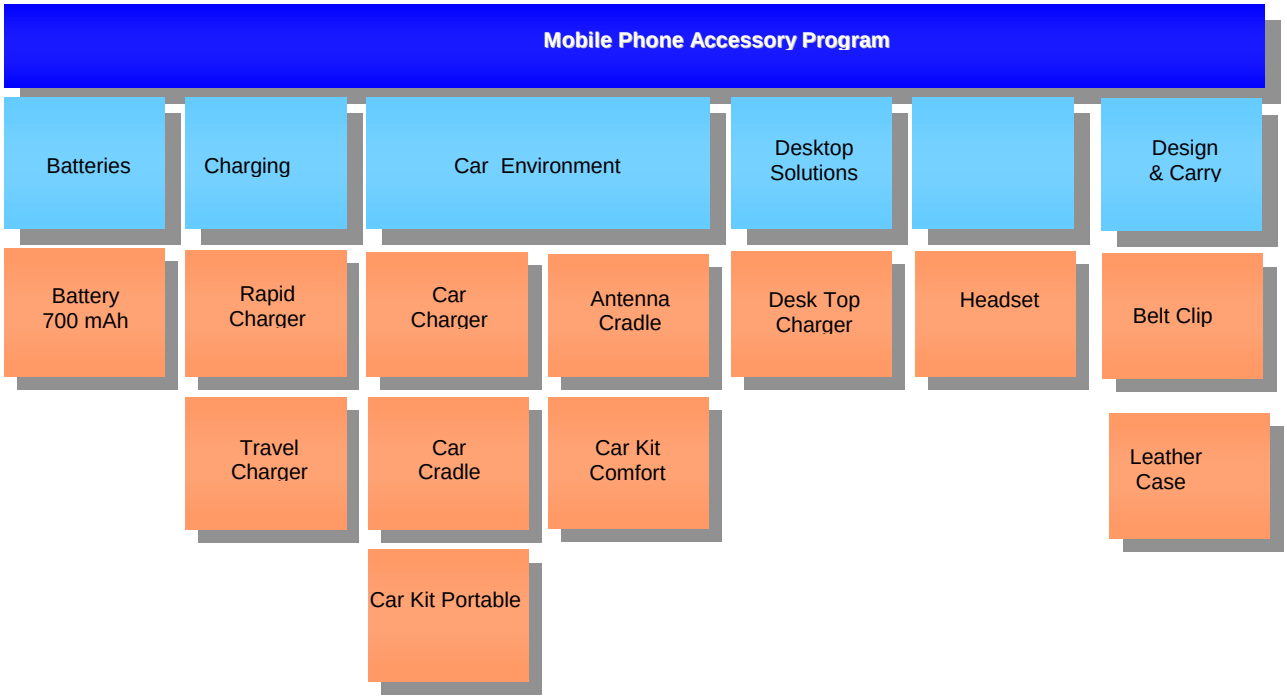
If you do not have access to this tool up to now, please contact your Siemens service manager for details.





9 Accessories

Overview of optional accessories:



9.1 Standard Charger (included in package)

Specifications: ➢ Voltage: 6.0Volts ➢ Current: 150mA ➢ Charging time: Up to 5 hours	

9.2 Battery (included in package)

Specifications: ➢ NiMH, 3.6V, 700mAh ➢ Standby time: up to 100 hours ➢ Talk time: up to 5 hours ➢ Charging time: Approx. 5 hours with Standard charger Approx. 1.5 hours with Rapid charger	

9.3 Spare Battery

Identical to the one supplied with the phone

- Technology: NiMH
- Voltage: 3.6V
- Capacity: 700mAh

9.4 Rapid Charger

The rapid charger speeds up the charging process to a duration of 1.5 hours.

- Compact charger in 5 country versions (EU, UK, US/ Taiwan, China, Australia)
- Quick charging time: approx. 1.5 hrs

9.5 Travel Charger

The Travel Charger is similar to the Rapid Charger, but enables the user to use the worldwide voltage range of 90-270 Volts.

- Compact size; 5 versions available (EU, UK, US/ Taiwan, China, Australia)
- Operating voltage: 90 – 270V
- Quick charging time: approx. 1.5 hrs
- Power supply for: Phone, Desk Top Charger

9.6 Desk Top Charger

The desktop charger forms a convenient stand for the mobile. It enables „easy drop in charging“ and connects to all available C25 chargers.

- Small attractive design fitting to C25
- Comfortable charging of the phone
- Power supply by Rapid Charger,
- Travel Charger, Car Charger

9.7 Designer Cases

A range of attractive protective cases for the telephone will be available.

9.8 Belt Clip

The belt clip allows easy and secure attachement to a belt. The phone can rotate to a convenient angle. ➢ Rotatable fixation ➢ Easy to remove ➢ Insertion in each angle possible ➢ Secure phone hold	

9.9 Headset

The headset offers safe hifh quality hands free use whilst walking or driving. ➢ Portable Handsfree Kit ➢ Full duplex digital quality ➢ Automatic call acceptance controlled by mobile phone menue ➢ Comfort fixation	

9.10 Car Cradle

The car cradle is supplied with an adjustable bracket. This enables secure and convenient siting of the telephone. ➢ Secure phone hold ➢ Safety supplement for in car use ➢ Individual angle positioning ➢ Park position for Car Charger etc. ➢ Comfort release	

9.11 Antenna cradle

This robust cradle provides simple automatic connection, use with other accessories and easy handheld use. ➢ Connection for external antenna ➢ Secure phone hold ➢ Safety supplement for in car use ➢ Individual angle positioning ➢ Park Position for Car Charger etc. ➢ Support privacy functionality	

9.12 Car Charger

- Power supply and battery charging
- Quick charging with auto switch over to trickle charging
- Power supply for Desk Top Charger
- Connection to cigar lighter (12V/24V)
- LED signalizing power supply
- Recommended use together with Car Cradle

9.13 Car Kit Portable

- High quality (duplex) handsfree
- Power supply and charging
- Installation in cigar lighter (12 V)
- Automatic call acceptance
- Permanent display illumination
- Volume control over side key or on mobile
- Rotatable speaker
- Variable microfone positioning
- LED indicates function mode

9.14 Car Kit Comfort

- High quality duplex handsfree
- Power supply and battery charging
- Radio mute
- Auto answer on / off
- Ignition detection
- Permanent display illumination
- Auto power off via ignition switch
- Seperate E-Box with plug and play connections
- Universal connector for external antenna
- Private functionality (via Car Handset)
- Secure phone hold

9.15 Car Handset

- Additional handset for private calls
- Direct call acceptance by lifting up handset
- Volume control directly on the handset
- Curley Cord
- Plug and play connector to handsfree unit

C25(88)

Level 2.5

Repair Documentation

V 1.2

1 Introduction

The C25 is the first dualband handset (GSM-900 and GSM-1800) in the C-class. The C2588 is a special version for the asian market featuring a graphic display instead of the alphanumeric C25 display.

The repairs for C25 and C2588 are identical unless otherwise noted.

Lately a new version of the C25 has been introduced. This version has the main processor HiGold version 4.3 of the S25(88). Internally this C25 is therefore called C25V4. The level 2.5 parts are identical to the old C25 version.

This manual is intended to help you carry out repairs on level 2.5, meaning limited component repairs. Failure highlights are documented and should be repaired in the local workshops.

It must be noted that all repairs have to be carried out in an environment set up according to the ESD (Electrostatic Discharge Sensitive Devices) regulations defined in international standards.

If you have any questions regarding the repair procedures or spare parts do not hesitate to contact our technical support team in Kamp-Lintfort, Germany:

Tel.: +49 2842 95 4666
Fax: +49 2842 95 4302
e-mail: dominik.schnoor@klf.siemens.de

Table of Contents:

1 INTRODUCTION 2

2 ANTENNA CONNECTOR 4

3 RINGER CONNECTOR 8

4 BOTTOM CONNECTOR (LUMBERG) 11

5 18µH COIL 14

6 ANTENNA SPRING 18

7 DISPLAY CONNECTOR 21

8 DISPLAY CAPACITORS 25

9 RINGER COIL 29

10 KEYPAD LEDS 32

2 Antenna Connector

2.1 Affected Units

2.1.1 Type: **C25**

2.1.2 Affected IMEIs / Date Codes: *All / All*

2.1.3 Affected SW-Versions: *All*

2.1.4 Fault Code for LSO reporting: 3ANC

2.2 Fault Description

2.2.1 Fault Symptoms for customers:

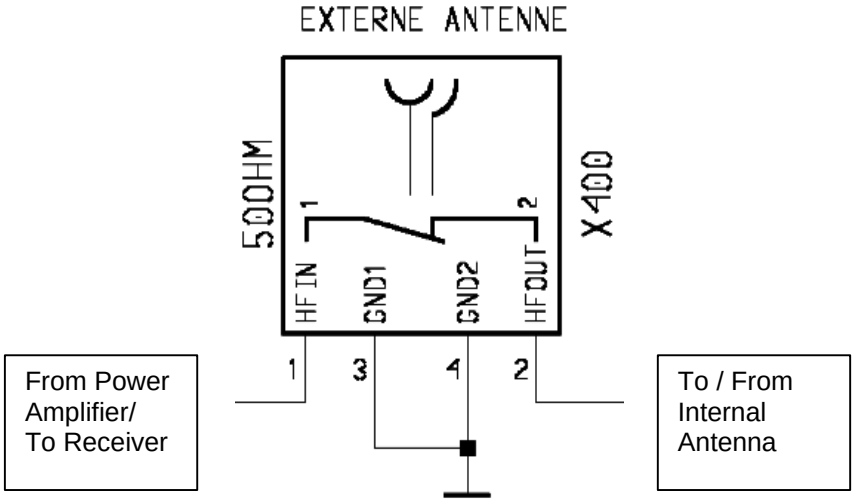
Network Search when using the external antenna (carkit)
No location update possible on external antenna (carkit)

2.2.2 Fault Symptom on GSM-Tester:

Output power problems on the external antenna
No location update possible

2.2.3 Component Information

The Antenna Connector is a mechanical switch operated by the RF plug of a carkit or, for testing purposes, of an RF clip.
Normally the RF signal goes to and comes from the internal antenna. Whenever an RF plug is plugged into the antenna connector the connection to the internal antenna is openend and the connection to the external antenna socket is made. See drawing below.



2.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

2.4 Repair Documentation

2.4.1 Description of procedure:

2.4.1.1 Diagnosis

Check the output power of the handset with the LSO testprogram.
Especially watch the external antenna power!

2.4.1.2 Repair by component change

Use hot air blower to remove defective connector
Avoid excessive heat!
Watch surrounding components!

Resolder new connector afterwards.

2.4.1.3 Repair by SW-Booting

Not possible!

2.4.1.4 Test

Retest handset after repair as described above.

2.4.2 List of needed material

2.4.2.1 Components

C25 antenna connector
Part-Number: L36334-Z93-C261

2.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

2.4.2.3 Special Tools

None

2.4.2.4 Working materials

Desolder Wick / Braid
Solder

2.4.3 Drawings

Figure 1: C25 Board Antenna Connector Side (Top View)

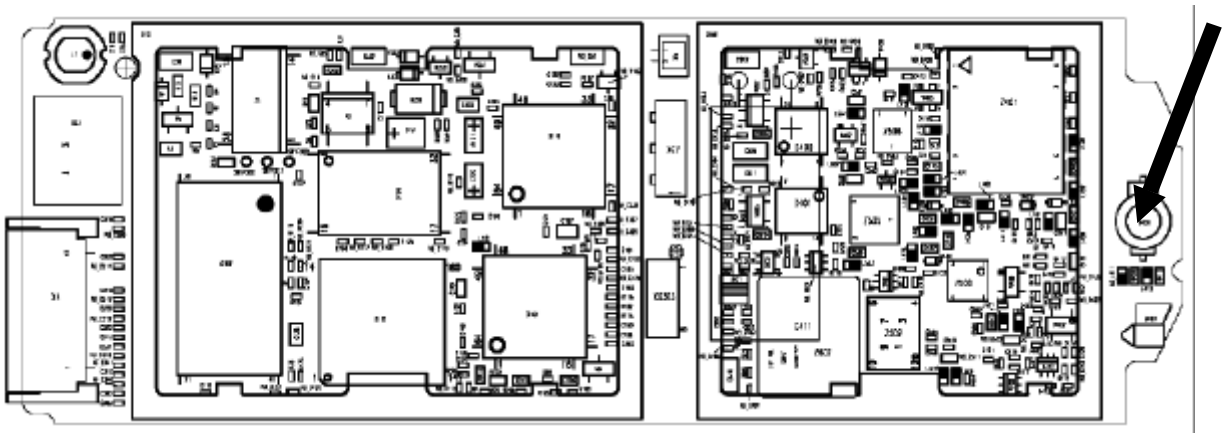
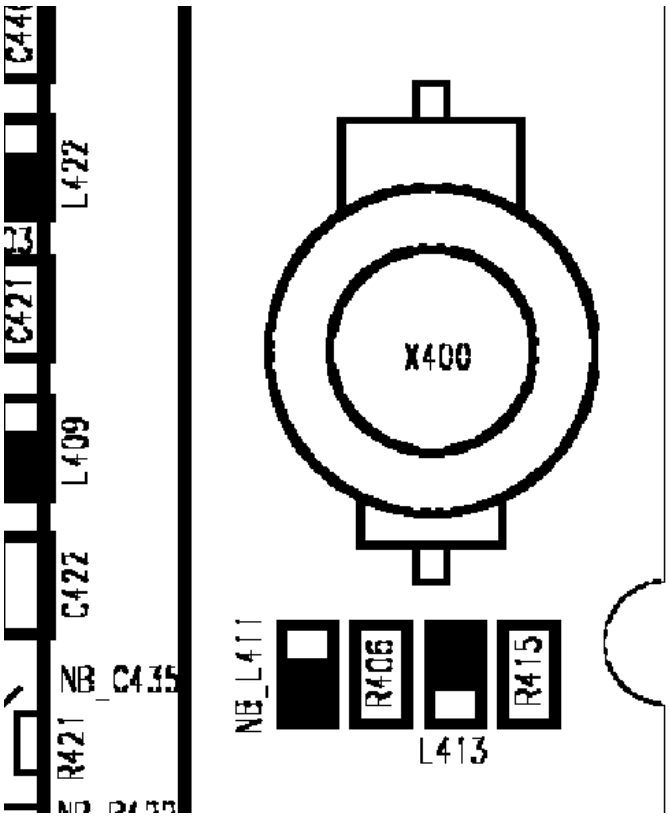


Figure 2: C25 Antenna Connector Placement (X400) (Top View)



3 Ringer Connector

3.1 Affected Units

3.1.1 Type: **C25**

3.1.2 Affected IMEIs / Date Codes: *All / All*

3.1.3 Affected SW-Versions: *All*

3.1.4 Fault Code for LSO reporting: 3RIC

3.2 Fault Description

3.2.1 Fault Symptoms for customers:

Problems with the handset ringer. No ringer tone audible.

3.2.2 Fault Symptom on GSM-Tester:

Handset fails ringer test.

3.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

3.4 Repair Documentation

3.4.1 Description of procedure:

The connector X5 is connecting the main board of the C25 with the piezo ringer through a two pin cable.

3.4.1.1 Diagnosis

Visually check the connector. Watch for bent contacts and dry joints.

3.4.1.2 Repair by component change

Resolder dry soldering joints.
If the connector is physically damaged use hot air blower or wick to remove defective connector.
Avoid excessive heat!
Watch surrounding components!

Resolder new connector afterwards.

3.4.1.3 Repair by SW-Booting

Not possible!

3.4.1.4 Test

Retest handset after repair.

3.4.2 List of needed material

3.4.2.1 Components

Ringer Connector C25:
Part-Number: L36334-Z97-C43

3.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

3.4.2.3 Special Tools

None

3.4.2.4 Working materials

Desolder Wick / Braid
Solder
Flux

3.4.3 Drawings

Figure 1: C25 Board Ringer Connector Side

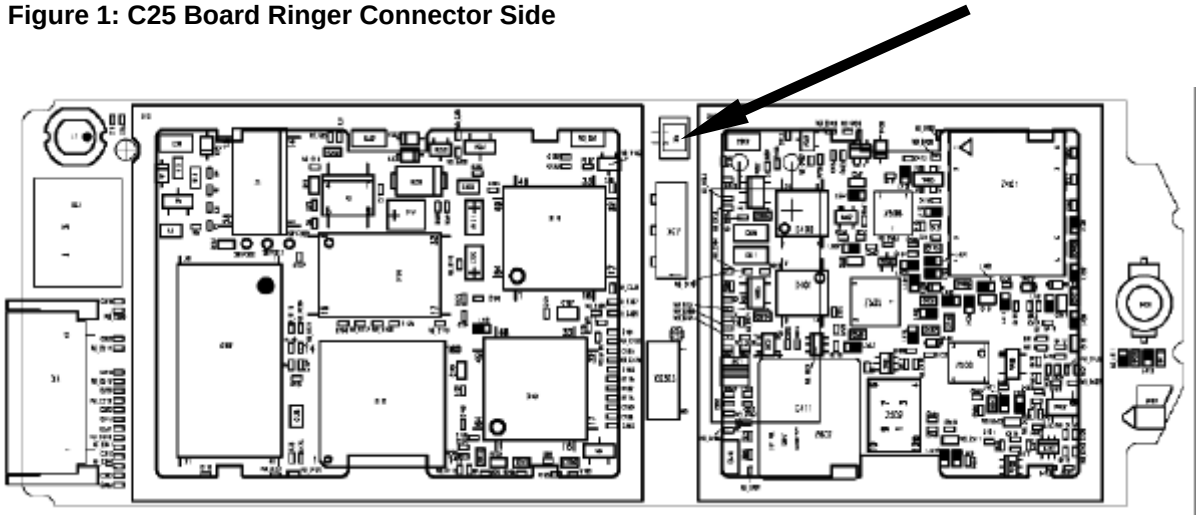
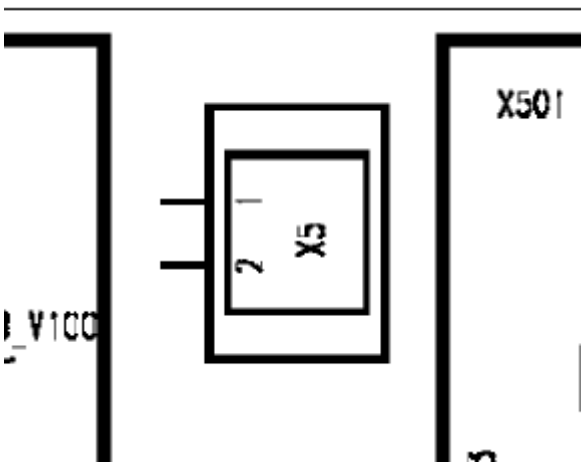


Figure 2: C25 Ringer Connector (X5) Placement (Top View)



4 Bottom Connector (Lumberg)

4.1 Affected Units

4.1.1 Type: **C25**

4.1.2 Affected IMEIs / Date Codes: *All / All*

4.1.3 Affected SW-Versions: *All*

4.1.4 Fault Code for LSO reporting: 3LUC

4.2 Fault Description

4.2.1 Fault Symptoms for customers:

Charging problems.
Problems with external loudspeaker or microphone when using a car kit.
Problems with accessories connected at the bottom connector.

4.2.2 Fault Symptom on GSM-Tester:

Testequipment cannot communicate with the handset.

4.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

4.4 Repair Documentation

4.4.1 Description of procedure:

4.4.1.1 Diagnosis

Visually check the bottom connector. Watch for dry joints!

4.4.1.2 Repair by component change

Use hot air blower remove defective bottom connector.
Avoid excessive heat!
Watch surrounding components!

Resolder new bottom connector afterwards.

4.4.1.3 Repair by SW-Booting

Not possible!

4.4.1.4 Test

Retest handset after repair.

4.4.2 List of needed material

4.4.2.1 Components

Bottom Connector C25
Part-Number: L36334-Z93-C262

4.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

4.4.2.3 Special Tools

None

4.4.2.4 Working materials

Desolder Wick / Braid
Solder

4.4.3 Drawings

Figure 1: C25 Board Bottom Connector Side

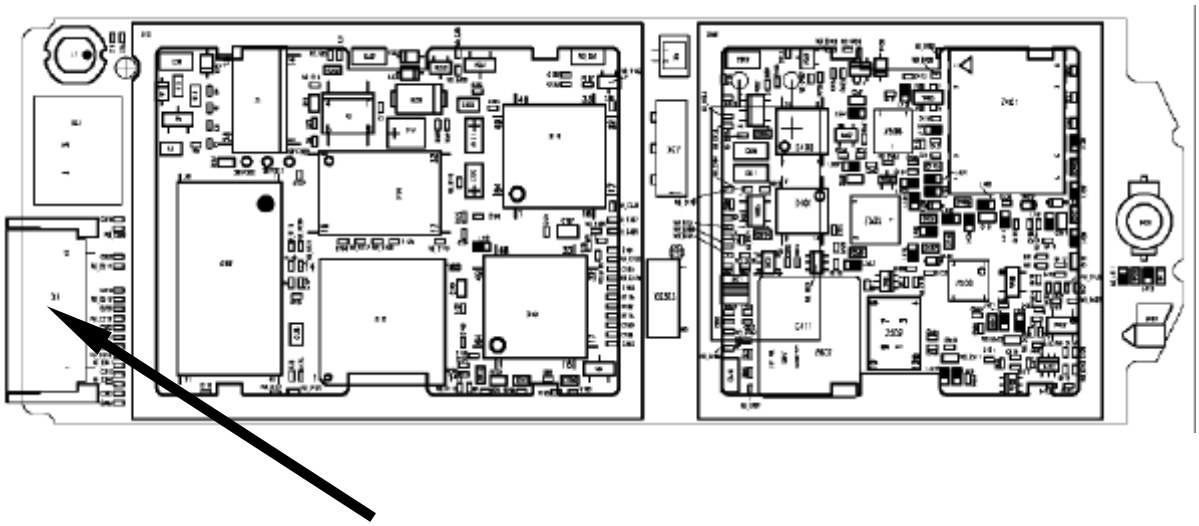
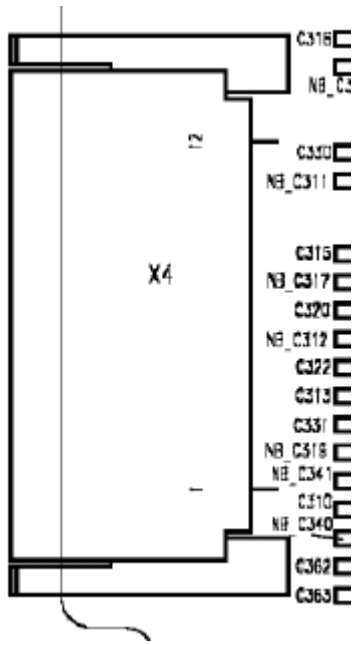


Figure 2: C25 Bottom Connector (X4) Placement (Top View)



5 18µH Coil

5.1 Affected Units

5.1.1 Type: **C25**

5.1.2 Affected IMEIs / Date Codes: *All / All*

5.1.3 Affected SW-Versions: *All*

5.1.4 Fault Code for LSO reporting: 3COI

5.2 Fault Description

5.2.1 Fault Symptoms for customers:

Loud humming noise in loudspeaker.

5.2.2 Fault Symptom on GSM-Tester:

Handset fails with loud humming noise in echo loop.

5.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

5.4 Repair Documentation

5.4.1 Description of procedure:

5.4.1.1 Diagnosis

The 18µH coil is used in the step up converter which is generating a 5.4 V supply voltage for the power amplifier out of the 2.8V battery voltage.
If the coil is mechanically damaged (broken) it produces heavy interference with the acoustical elements of the C25 resulting in a loud humming noise in the earpiece.

A broken coil can easily be diagnosed by trying to move it with two fingers. If it moves, the core is broken and the coil has to be replaced.

5.4.1.2 Repair by component change

Use hot air to remove defective coil.
Avoid excessive heat!
Watch surrounding components!!

Resolder new coil afterwards

5.4.1.3 Repair by SW-Booting

Not possible!

5.4.1.4 Test

Retest handset after repair by checking the audio quality with the echo loop of the testprogram.

5.4.2 List of needed material

5.4.2.1 Components 18µH Coil

Part-Number: L36151-F5183-M

5.4.2.2 Jigs and Tools

Soldering Iron
Hot Air Blower

5.4.2.3 Special Tools

None

5.4.2.4 Working materials

Desolder Wick / Braid
Solder

5.4.3 Drawings

Figure 1: C25 Board 18µH Coil (L201) Side

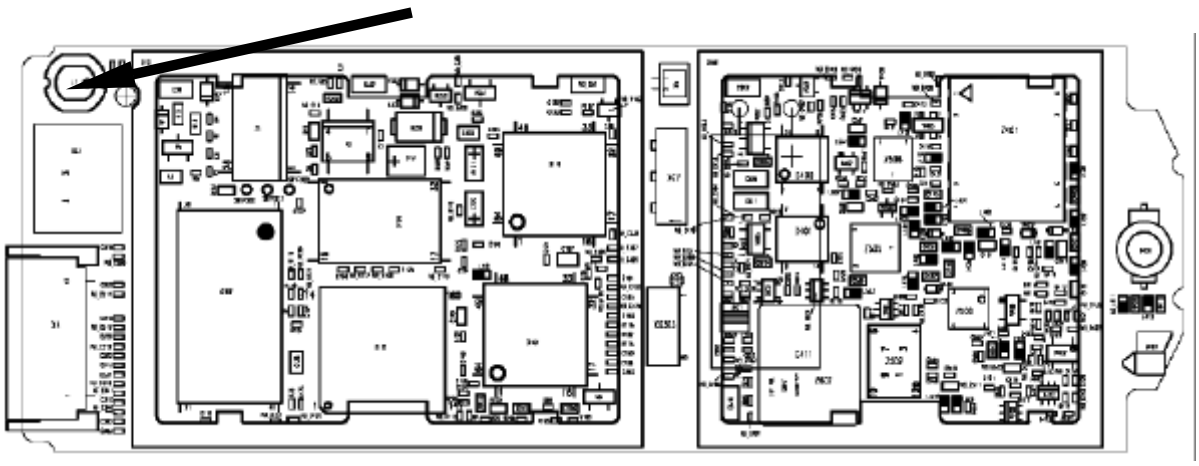
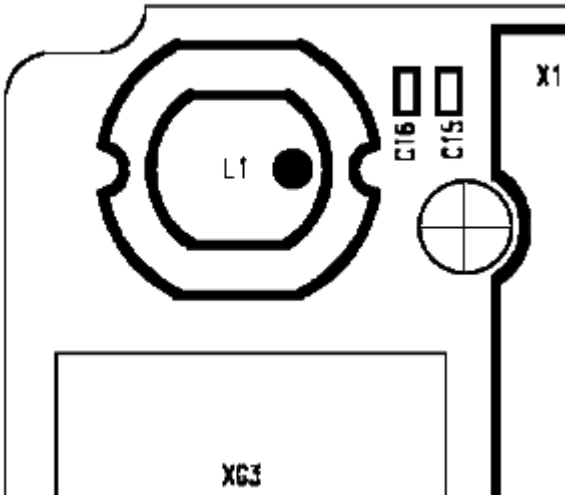


Figure 2: C25 18µH Coil (L1) Placement (Top View)



6 Antenna Spring

6.1 Affected Units

6.1.1 Type: **C25**

6.1.2 Affected IMEIs / Date Codes: *All / All*

6.1.3 Affected SW-Versions: *All*

6.1.4 Fault Code for LSO reporting: 3ANS

6.2 Fault Description

6.2.1 Fault Symptoms for customers:

Network Search.
Handset drops calls.

6.2.2 Fault Symptom on GSM-Tester:

Power problems on the ***internal*** antenna of the handset only.

6.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

6.4 Repair Documentation

6.4.1 Description of procedure:

The antennaspring connects the main board with the internal antenna of the handset.

6.4.1.1 Diagnosis

Visually check the status of the spring. Bent or oxidated springs have to be replaced.

6.4.1.2 Repair by component change

Use soldering iron to remove defective spring.
Avoid excessive heat!
Watch surrounding components!

Resolder new spring afterwards.

6.4.1.3 Repair by SW-Booting

Not possible!

6.4.1.4 Test

Retest handset after repair.

6.4.2 List of needed material

6.4.2.1 Components

Antenna Spring C25
Part-Number: L36158-A25-C9

6.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

6.4.2.3 Special Tools

None

6.4.2.4 Working materials

Desolder Wick / Braid
Solder

6.4.3 Drawings

Figure 1: C25 Board Antenna Spring Side

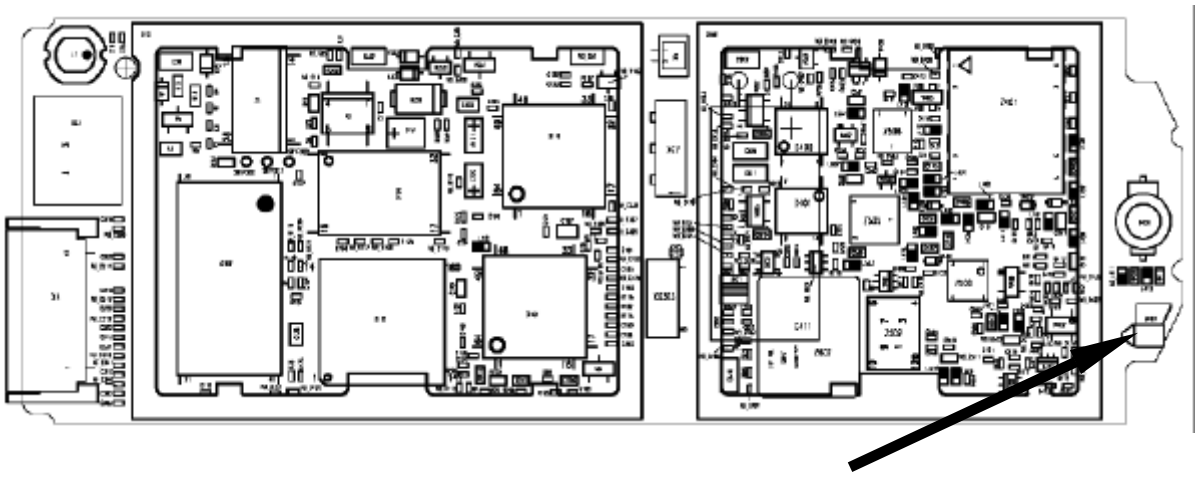
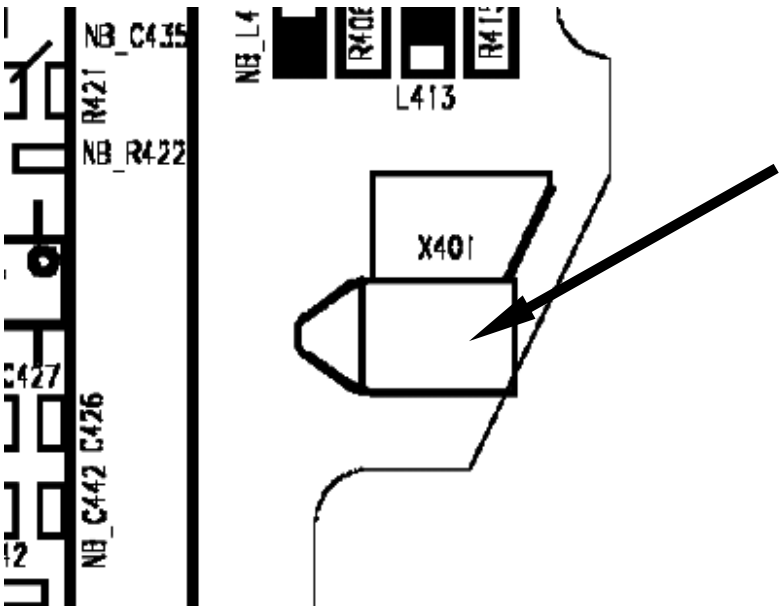


Figure 2: C25 Antenna Spring (X401) Placement (Top View)



7 Display Connector

7.1 Affected Units

7.1.1 Type: **C25**

7.1.2 Affected IMEIs / Date Codes: *All / All*

7.1.3 Affected SW-Versions: *All*

7.1.4 Fault Code for LSO reporting: 3DIC

7.2 Fault Description

7.2.1 Fault Symptoms for customers:

Display problems.
Missing Lines or columns on the LCD.

7.2.2 Fault Symptom on GSM-Tester:

Handset fails display test.

7.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

7.4 Repair Documentation

7.4.1 Description of procedure:

7.4.1.1 Diagnosis

Visually check the status of the connector. Check the opening/closing mechanism and watch for dry joints.

7.4.1.2 Repair by component change

Use soldering iron to resolder dry joints or use hot air blower to remove defective connector.
Avoid excessive heat!
Watch surrounding components!

Resolder new connector afterwards.

7.4.1.3 Repair by SW-Booting

Not possible!

7.4.1.4 Test

Retest handset after repair.

7.4.2 List of needed material

7.4.2.1 Components

Remark: Both C25 and C2588 use the same connector, but the placement position is slightly different!

Display Connector C25(88)
Part-Number: L36195-Z26-C624

7.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

7.4.2.3 Special Tools

None

7.4.2.4 Working materials

Desolder Wick / Braid
Solder

7.4.3 Drawings

Figure 1: C25 Board Display Connector Side

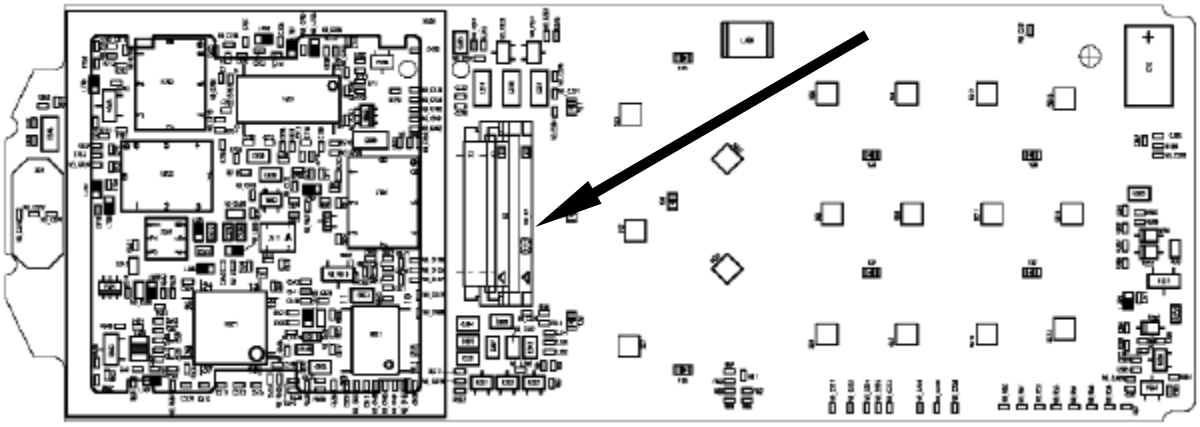
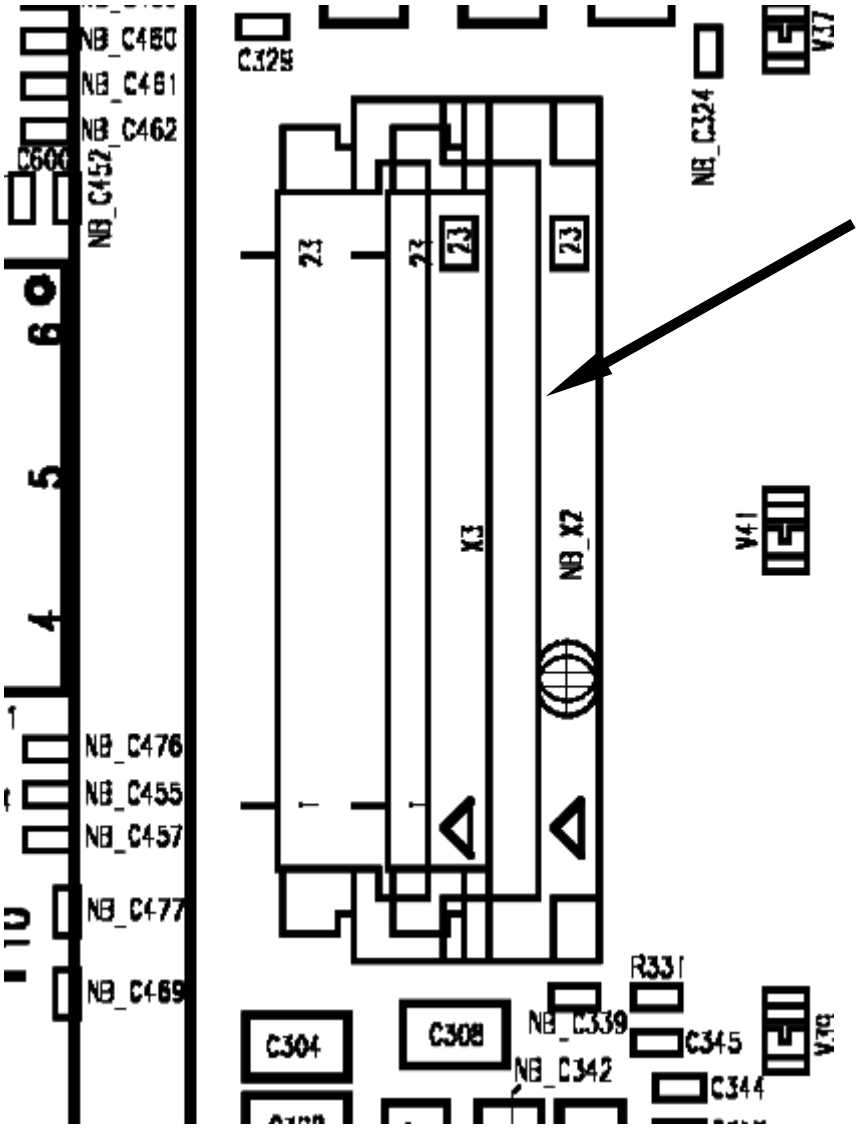


Figure 2: C25 Display Connector (X3) and C2588 Display Connector (X2) Placement (Top View)


NB_C460
NB_C461
NB_C462
C500
NB_C452
NB_C476
NB_C455
NB_C457
NB_C477
NB_C469
C325
NB_C324
V17
X3
NB_X2
V41
R331
C304
C308
NB_C339
C345
NB_C342
C344

8 Display Capacitors

8.1 Affected Units

8.1.1 Type: **C25**

8.1.2 Affected IMEIs / Date Codes: *All / All*

8.1.3 Affected SW-Versions: *All*

8.1.4 Fault Code for LSO reporting: 3DCA

8.2 Fault Description

8.2.1 Fault Symptoms for customers:

The display is not working at all or shows strange characters.

8.2.2 Fault Symptom on GSM-Tester:

Handset fails display test.

8.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

8.4 Repair Documentation

8.4.1 Description of procedure:

8.4.1.1 Diagnosis

The capacitors are used to buffer the supply voltage of the display controller. Especially C308 has occasionally been found defective. Check the status of the capacitors by measuring ist capacitance with a appropriate measurement device. The capacitance must be in the 220nF range. Defective caps often have a lower capacitance around 100nF.

8.4.1.2 Repair by component change

Use hot air blower or soldering iron to remove defective capacitor.
Avoid excessive heat!
Watch surrounding components!

Resolder new capacitor afterwards.

8.4.1.3 Repair by SW-Booting

Not possible!

8.4.1.4 Test

Retest handset after repair.

8.4.2 List of needed material

8.4.2.1 Components

Display Capacitor C25(88)
Part-Number: L36375-F3224-K

8.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

8.4.2.3 Special Tools

None

8.4.2.4 Working materials

Desolder Wick / Braid
Solder

8.4.3 Drawings

Figure 1: C25 Board Display Capacitor Side

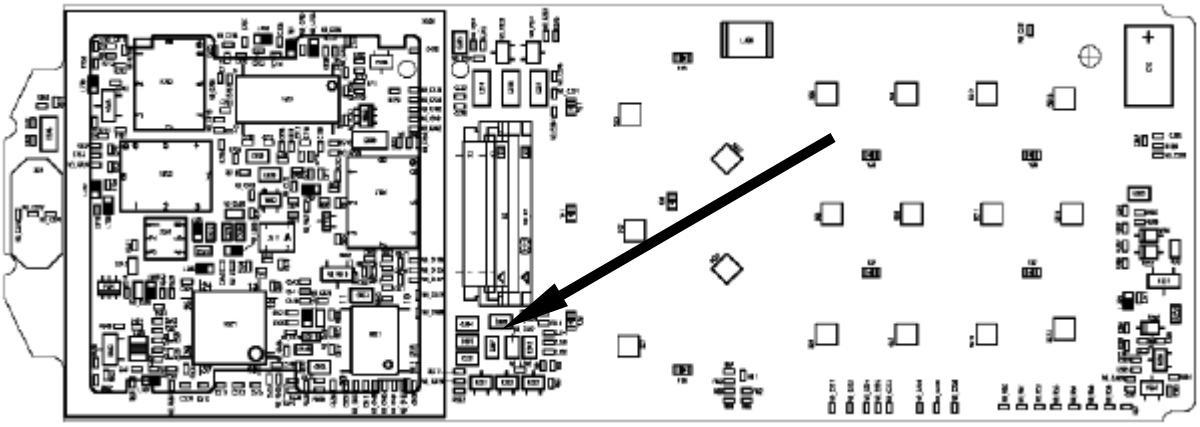
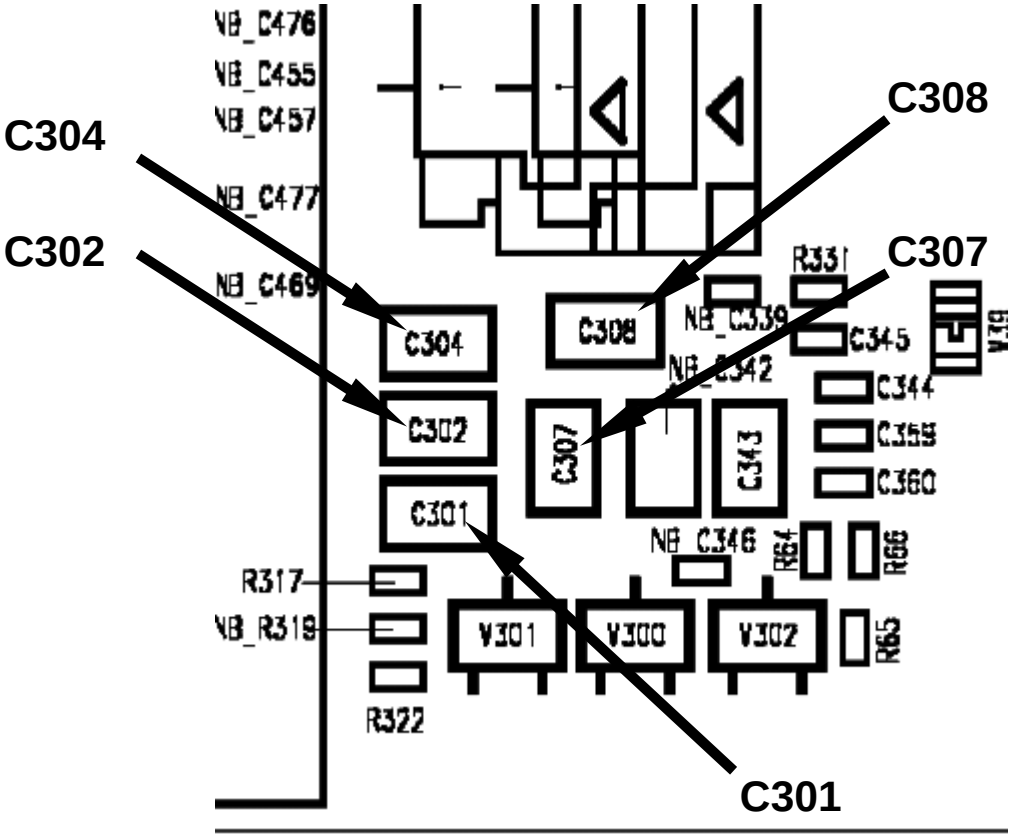


Figure 2: C25 Display Capacitor (C301, C302, C304, C307, C308) Placement


C304
C302
C308
C307
C301
NB_C476
NB_C455
NB_C457
NB_C477
NB_C469
R331
NB_C339
C345
C344
C359
C360
NB_C342
C343
C346
R64
R66
R65
R317
NB_R319
R322
V301
V300
V302
C304
C308
C302
C307
C301

9 Ringer Coil

9.1 Affected Units

9.1.1 Type: **C25**

9.1.2 Affected IMEIs / Date Codes: *All / All*

9.1.3 Affected SW-Versions: *All*

9.1.4 Fault Code for LSO reporting: 3RCO

9.2 Fault Description

9.2.1 Fault Symptoms for customers:

The handset ringer (buzzer) is not working or the Ringer level is too low

9.2.2 Fault Symptom on GSM-Tester:

Handset fails ringer test.

9.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

9.4 Repair Documentation

9.4.1 Description of procedure:

9.4.1.1 Diagnosis

The coil is used to generate the voltage to operate the piezo ringer. If it is defective, the ringer cannot work anymore.
Check the status of the coil by measuring its resistance with a multimeter. The resistance must be very low. Also broken coils have to be replaced.

9.4.1.2 Repair by component change

Use hot air blower or soldering iron to remove defective coil.
Avoid excessive heat!
Watch surrounding components!

Resolder new coil afterwards.

9.4.1.3 Repair by SW-Booting

Not possible!

9.4.1.4 Test

Retest handset after repair.

9.4.2 List of needed material

9.4.2.1 Components

Ringer Coil C25(88)
Part-Number: L36151-F5105-K3

9.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

9.4.2.3 Special Tools

None

9.4.2.4 Working materials

Desolder Wick / Braid
Solder

9.4.3 Drawings

Figure 1: C25 Board Ringer Coil Side

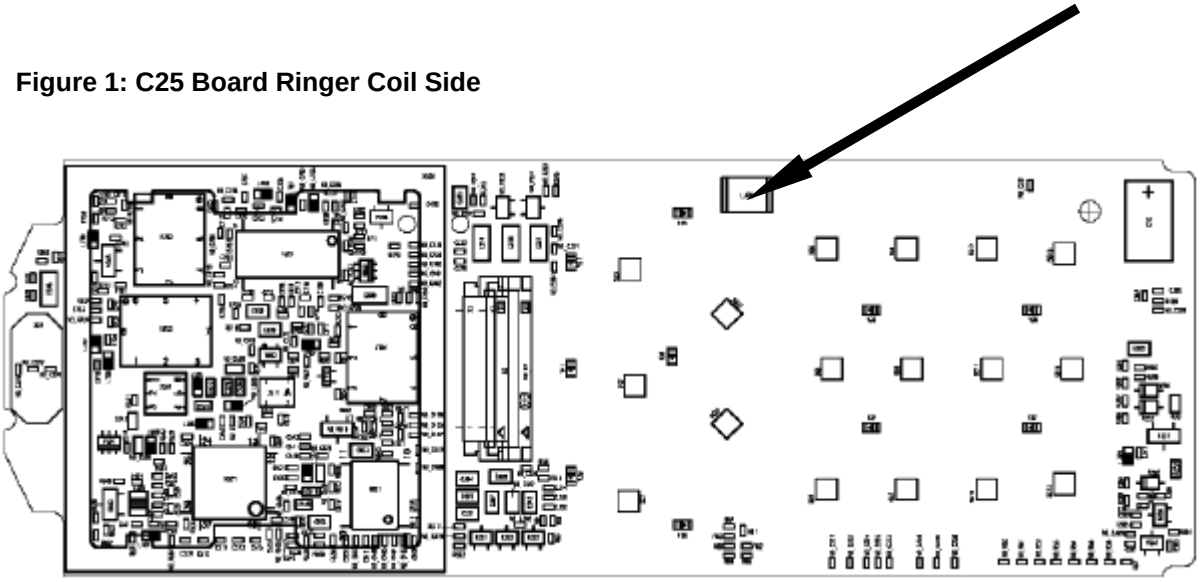
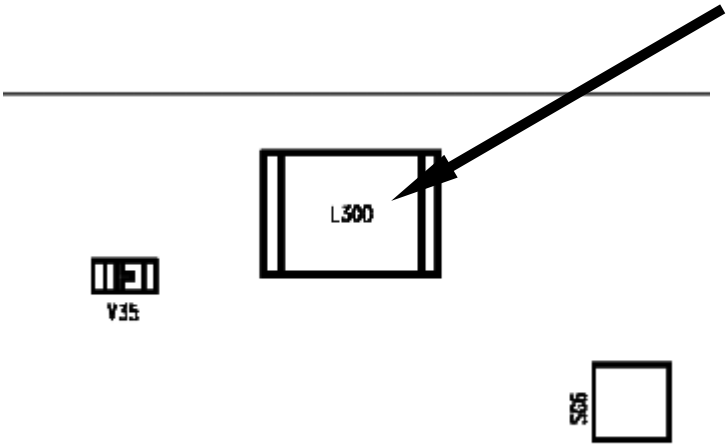


Figure 2: C25 Ringer Coil (L300) Placement (Top View)



10 Keypad LEDs

10.1 Affected Units

10.1.1 Type: **C25**

10.1.2 Affected IMEIs / Date Codes: *All / All*

10.1.3 Affected SW-Versions: *All*

10.1.4 Fault Code for LSO reporting: 3LED

10.2 Fault Description

10.2.1 Fault Symptoms for customers:

The display/keypad illumination is not working properly.

10.2.2 Fault Symptom on GSM-Tester:

This fault cannot be tested with the GSM-Tester.

10.3 Priority:

☐ ..... Mandatory
☒ ..... Repair
☐ ..... Optional
☐ ..... Not Yet Defined

10.4 Repair Documentation

10.4.1 Description of procedure:

10.4.1.1 Diagnosis

The nine LEDs are providing the illumination both for the display and for the keyboard. Just switch on the phone without upper case and remove the keyboard. Now visually check the function of the LEDs.

10.4.1.2 Repair by component change

Use hot air blower or soldering iron to remove defective LED.
Watch the polarity of the LED!
Avoid excessive heat!
Watch surrounding components!

Resolder new LED afterwards.

10.4.1.3 Repair by SW-Booting

Not possible!

10.4.1.4 Test

Retest handset after repair.

10.4.2 List of needed material

10.4.2.1 Components

LED C25(88)
Part-Number: L36840-L2031-D670

10.4.2.2 Jigs and Tools

Hot Air Blower
Soldering Iron

10.4.2.3 Special Tools

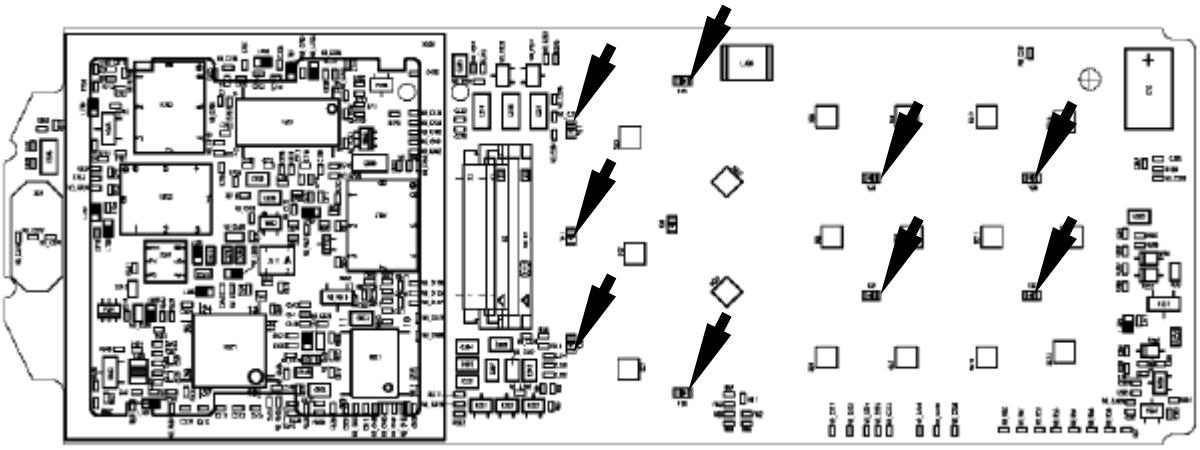
None

10.4.2.4 Working materials

Desolder Wick / Braid
Solder

10.4.3 Drawings

Figure 1: C25 Board LED Side



MEMO